Airborne Isotopic Hydrocarbon Analyzer for Titan, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

Trace species measurement on unmanned atmospheric research craft suitable for interplanetary travel is a demanding application for optical sensing techniques. Yet optical techniques offer many advantages including high-precision, fast response, and strong species selectivity. Balloonsonde, kite, unmanned aerial vehicle (UAV), or glider deployment demands that optical sensors meet stringent size, weight and power requirements. Vista Photonics proposes to develop rugged, compact, battery-powered optical sensor technology capable of selectively determining hydrocarbons and selected isotopomers at Titan-relevant concentrations. The enabling technology for meeting stringent NASA mission requirements is a new rugged, compact, and lightweight optical path length enhancement cell that recovers the established sensitivity of high-performance optical absorption detection techniques on a platform with no moving parts. The proposed spectrometer will be capable of detecting multiple species with little additional weight or power penalties.

Anticipated Benefits

Potential NASA Commercial Applications: Phase III commercial applications abound for sensors whose performance and physical characteristics are suitable for spaceflight. Examples include contaminant monitoring in process gas streams in the chemical and microelectronics industries, medical diagnosis through detection of biogenic gases in human breath that correlate to specific pathologies, and environmental monitoring and regulatory compliance in agriculture, power production, and occupational safety. The fully-developed Phase II instruments shall offer a compelling and desirable blend of performance, affordability, compactness, simplicity and ease-of-use relative to present commercial product offerings in these applications.

Airborne Isotopic Hydrocarbon Analyzer for Titan, Phase I

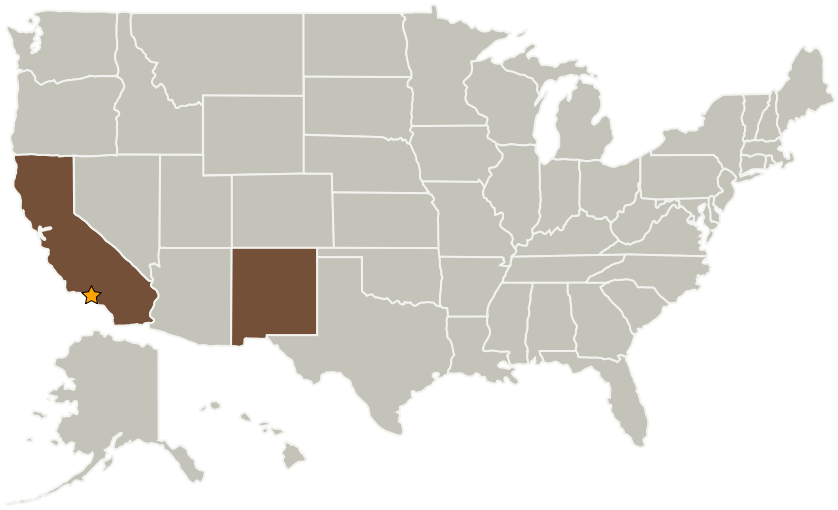
Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	2
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3

Airborne Isotopic Hydrocarbon Analyzer for Titan, Phase I

Completed Technology Project (2008 - 2008)

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Vista Photonics, Inc.	Supporting Organization	Industry	Santa Fe, New Mexico

Primary U.S. Work Locations	
California	New Mexico

Project Transitions

February 2008: Project Start

August 2008: Closed out

Closeout Summary: Airborne Isotopic Hydrocarbon Analyzer for Titan, Phase I Project Image

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

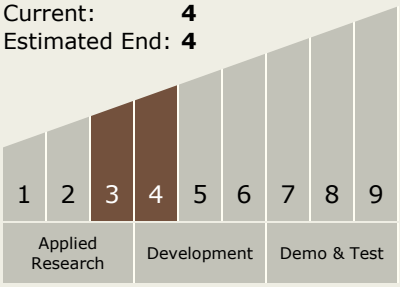
Carlos Torrez

Principal Investigator:

Jeffrey Pilgrim

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Airborne Isotopic Hydrocarbon Analyzer for Titan, Phase I

Completed Technology Project (2008 - 2008)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors